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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/599,514	12/15/2006	Zilong Peng	L&S-01	1133
20311 7590 08/09/2007 LUCAS & MERCANTI, LLP 475 PARK AVENUE SOUTH 15TH FLOOR NEW YORK, NY 10016			EXAMINER TRAN, MICHAEL THANH	
			ART UNIT 2827	PAPER NUMBER
			MAIL DATE 08/09/2007	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/599,514

Applicant(s)

PENG ET AL.

Examiner

MICHAEL T. TRAN

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on September 29, 2006 through December 15, 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 9-15 is/are allowed.
- 6) ☒ Claim(s) 1,2,8,16-22 and 24 is/are rejected.
- 7) ☒ Claim(s) 3-7 and 23 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.


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Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 121506.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

1. In response to the Communications dated September 29, 2006 through December 15, 2006, claims 1-24 are active in this application.

Foreign Priority

2. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a) (d), which papers have been placed of record in the file.

Information Disclosure Statement

3. The information disclosure statements filed December 15, 2006 have been considered.

Claim Objections

4. Claims 3-7 and 23 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

It appears that the phrase "any of" in claims 8, 15 and 24 should be deleted.

It appears that claims 18 and 19 conflict with the independent claim from which they depend, claim 16. In claim 16, the limitations recites that there exists a wordline that is vertical to a bitline. However, in claims 18 and 19, the limitation recites that the bitline is vertical to the wordline.

Claim Rejections- 35 U.S.C. § 102

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5. The following is a quotation of the appropriate paragraphs of 35 U.S.C.

102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in-

(1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

6. Claim 1 is rejected under 35 U.S.C 102(b) as being anticipated by

Li et al. [U.S. Patent Application # 20040082082].

With respect to claim 1, Li et al. disclose, in figure 1, a control method of an MRAM (Magnetoresistive Random Access Memory) based on vertical current writing, characterized in that the writing operation of information in a magnetic film cell MFC [30a] of the MRAM is implemented by corporate effect of magnetic fields generated by a current parallel to the MFC [Hwl] and another current vertical to the MFC and passing through this MFC [Hdl].

7. Claims 2 and 8 are rejected under 35 U.S.C 102(b) as being anticipated by

Pakata et al. [U.S. Patent Application # 20050106810].

With respect to claim 2, Pakata et al. disclose, in figure 2, an MRAM based on vertical current writing, comprising: a) a memory control unit array composed of transistor units [source/gate/drain – figure 2], the control unit array being integrated in a semiconductor substrate [inherent]; b) a memory cell array composed of a magnetic film cell [130]; c) contact holes [120] and a transitional metal layer [131], the magnetic film cell being connected to the transistor units through the contact holes and the transitional metal layer; and d) a word line [110] and a bit line BL [150], characterized in that the bit line BL being arranged above on the magnetic film cell, directly connected with the magnetic film cell, and vertical to an easy magnetization direction of the magnetic film cell. It is noted that figure 2 is a simplified schematic of a larger array, which consists of a plurality of elements shown.

With respect to claim 8, Pakata et al. disclose there are altogether two internal metal wiring layers, i.e., a layer where the bit line BL locates and a layer where the transitional metal layer and the ground line GND locate. It is noted that Pakata et al. indicates that there are a multiple of layers.

8. Claims 16-22 and 24 are rejected, as understood, under 35 U.S.C 102(b) as being anticipated by Nguyen et al. [U.S. Patent Application # 20040130936].

With respect to claim 16, Nguyen et al. disclose an MRAM (Magnetoresistive Random Access Memory) based on vertical current writing, comprising: a) a memory read/write control unit array composed of transistor units [222, figure 2], the read/write control unit array being integrated in a semiconductor substrate [inherent]; b) a memory

cell array composed of a magnetic film cell [100']; c) contact holes [305]; and d) two word lines WL1 and WL2 [any number of wordlines, figure 2] and a bit line BL [any bitline, figure 2], characterized in that the word line WL2 [308, figure 3] being connected directly to the magnetic film cell and is vertical to the bit line BL [306, figure 3].

With respect to claim 17, Nguyen et al. disclose, in figure 3, the basic structure of the magnetic film cell is constituted by two magnetic material layers [any number of layers shown] and a nonmagnetic material layer interposed between the two magnetic material layers, and the stored information is represented and stored by the magnetization state of one of the magnetic material layers. See figures 1-3.

With respect to claim 18, Nguyen et al. disclose, in figure 3, that the bitline is vertical to the magnetic element.

With respect to claim 19, Nguyen et al. disclose, in figure 3, that the wordline and bitline are separated by an insulating layer [307].

With respect to claim 20, Nguyen et al. disclose, in figures 2 and 3, that the word line [254] is connected to the gate of transistor 222.

With respect to claim 21, Nguyen et al. disclose, in figure 2, that reading and writing of the cell is done via the word line coupled to the transistor 222.

With respect to claim 22, Nguyen et al. disclose, in figure 3, that there exists a transitional metal layer, the magnetic film cell being connected to the transistor unit through the transitional metal layer and the contact hole.

With respect to claim 24, Nguyen et al. disclose, in figure 3, that there are multiple layers.

Allowable Subject Matter

9. Claims 9-15 are allowable over the prior art of record.

10. The following is an Examiner's statement of reasons for the indication of allowable subject matter: the prior art of records does not show (in addition to the other elements in the claim) the following:

- a current-limiting mechanism is arranged which can be constituted by a diode and/or a transistor, and one or more current-limiting mechanisms are connected to each bit line BL and are arranged in a peripheral circuit of the MRAM array.
- the bit lines BL1 (3a) and BL2 (3g) are isolated by insulation medium and are parallel to each other in direction, and meantime the bit line BL2 (3g) is connected directly to the magnetic film cell MFC (2).
- the process of its writing operation is implemented by cooperative effect of a current parallel to the magnetic film cell MFC (2) on the bit line BL (3a) and a current introduced from the word line WL2 (3g), vertical to the magnetic film cell MFC (2) and passing through the magnetic film cell MFC.

Conclusion

11. When responding to the Office action, Applicants are advised to provide the Examiner with line and page numbers of the application and/or references cited to assist the Examiner in the prosecution of this case.

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12. Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Michael T. Tran whose telephone number is (571) 272-1795. The Examiner can normally be reached on Monday-Thursday from 7:30-6:00 P.M.

13. Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (571) 272-1650.



Michael T. Tran
Art Unit 2827
August 5, 2007